

*Required for students who earned less than an A on the last test.*

## Pre Calculus Honors Unit 2 Test Preparation

**You should already have a personal study guide covering the following topics from 2.1 - 2.4:**

- How do I factor trinomials in the form  $ax^2 + bx + c$ ?
- How do I factor trinomials in the form  $ax^2 + bx + c$  using the grouping method?
- How do I factor special patterns? (Difference of squares, Difference of cubes, Sum of cubes)
- How do I tell if a function is a polynomial?
- How do I sketch a graph of a polynomial?
- How do I write a possible factored form equation given a graph? How do I apply that to different situations (such as a table?)
- How do I multiply out a factored form equation into standard form?
- Key vocabulary - polynomial, root, zero, multiplicity, end behavior, leading coefficient, turning points
- *Extra (from last year that you are still expected to know)*
  - Do I still know how to I graph quadratics, find the vertex and axis of symmetry, write the exact equation from a graph, etc or should I review that as well?

**1. To prepare for your test add content to your previous personal study guide. Use the guiding questions below to pull out important topics from 2.5 & 2.6:**

- Can I divide two polynomials using either synthetic or long division when appropriate?
- Given a graph, a zero, OR a factor of a high-degree polynomial, can I use division and factoring to completely factor the original equation?
- Can I generate a list of possible factors and use that to factor a polynomial completely? Do I know the quadratic formula?
- Can I create a polynomial of n-th degree given certain conditions for zeros or function values?

**2. Complete at least three questions from each section on the back of this study guide.**

**3. Review your quizzes, homework, classwork practice, and warm-ups. Practice specifically with the problems you missed!**

Your study guide (3 points) and the practice problems (2 points) are homework grades.

*Your test is on Tuesday, October 27. You are welcome to attend a tutorial (any afternoon but Thursday) or stop by during lunch (any day but Tuesday) with specific questions or areas to review. Please let Mrs. Pike know in advance that you are coming!*

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### Section A:

2.  $3i(2 + i)$
4.  $\frac{1+i}{1-i}$
6.  $(2 - \sqrt{-3})^2$

### Section B:

Graph. List domain and range.

9.  $f(x) = 5 - (x + 2)^2$
11.  $f(x) = 3x^2 - 6x + 1$

### Section C:

In Exercises 12–20, find all zeros of each polynomial function. Then graph the function.

12.  $f(x) = (x - 2)^2(x + 1)^3$
13.  $f(x) = -(x - 2)^2(x + 1)^2$
14.  $f(x) = x^3 - x^2 - 4x + 4$
15.  $f(x) = x^4 - 5x^2 + 4$
16.  $f(x) = -(x + 1)^6$
17.  $f(x) = -6x^3 + 7x^2 - 1$
18.  $f(x) = 2x^3 - 2x$
19.  $f(x) = x^3 - 2x^2 + 26x$
20.  $f(x) = -x^3 + 5x^2 - 5x - 3$

### Section D:

In Exercises 21–26, solve each polynomial equation.

21.  $x^3 - 3x + 2 = 0$
22.  $6x^3 - 11x^2 + 6x - 1 = 0$
23.  $(2x + 1)(3x - 2)^3(2x - 7) = 0$
24.  $2x^3 + 5x^2 - 200x - 500 = 0$
25.  $x^4 - x^3 - 11x^2 = x + 12$
26.  $2x^4 + x^3 - 17x^2 - 4x + 6 = 0$

### Section E:

In Exercises 30–31, divide, using synthetic division if possible.

30.  $(6x^4 - 3x^3 - 11x^2 + 2x + 4) \div (3x^2 - 1)$
31.  $(2x^4 - 13x^3 + 17x^2 + 18x - 24) \div (x - 4)$

In Exercises 32–33, find an  $n$ th-degree polynomial function with real coefficients satisfying the given conditions.

32.  $n = 3$ ; 1 and  $i$  are zeros;  $f(-1) = 8$
33.  $n = 4$ ; 2 (with multiplicity 2) and  $3i$  are zeros;  $f(0) = 36$
34. Does  $f(x) = x^3 - x - 5$  have a real zero between 1 and 2?

Show all work on separate sheet of paper!  
While you may use a graphing calculator to check, you will not have one on your test.

The answer key will be provided in class on Monday and posted to the willispace Monday afternoon.